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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,928	12/27/2000	Byung-Young Ahn	3430-0140P	3449

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

TRAN, BINH X

ART UNIT PAPER NUMBER

1765

DATE MAILED: 10/27/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/747,928

Applicant(s)

AHN, BYUNG-YOUNG

Examiner

Binh X Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-17, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9-12-2003 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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4. Claims 17, 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Dhindsa et al. (US 5,904,779).

Dhindsa discloses a method of processing a substrate comprising:
providing an electrode plate (206);
before lifting the pin positioning a substrate (208) at a predetermined distance from the electrode plate using thickness of the insulate film (210) to obtain an intermediate structure (Fig 2B, Note: the examiner interpret the thickness of the insulating layer 210 read on "a predetermined distance from the electrode plate")
processing the intermediate structure;
removing the substrate from the electrode plate (abstract).

Dhindsa further discloses that the sticking force (read on "electrostatic attraction between the substrate and the electrode plate") is depending on the distance and it is produced by electrostatic chuck (206). According to Dhindsa, an increase in distance would decrease in electrostatic force. The electrode static chuck has an insulating material (210) over it. The thickness of the insulating layer (210) creates a space/distance between the substrate and the electrode (i.e., electrostatic chuck 206). Therefore, before lifting the pins, this distance (the thickness of layer 210) inherently reduce electrostatic force in comparison without having this distance.

Respect to claim 19, Dhindsa teaches the step of positioned the substrate at the predetermined position from the electrode plate (206) by placing an intermediate material (210) between the substrate (208) and electrode plate (Fig 2A, col. 4 lines 6-15).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-10, 12, 14-16 are rejected under 35 U.S.C 103(a) as being unpatentable over Dhindsa in view of Kanno (US 6,243,251) and further in view of Nakamura (US 6,096,572)

Respect to claim 7, Dhindsa discloses a method comprising an apparatus having:

a process chamber having a gas inlet, the gas inlet allowing a reactive gas (i.e., plasma) into the process chamber;

a first electrode arranged at a predetermined location in the process chamber (col. 4 lines 1-2);

a second electrode (206) in the chamber spaced apart from and opposite to the first electrode, having insulating film (210), a plurality of lift pins (218) received in a plurality of hole, the insulating material (210) being arranged between the plurality of lifts pin (See Fig 2a-2c);

a power source (RF source, see col. 4 lines 2, and electrical connecting arrangement (224) for applying voltage to the first and second electrode;

arranging the substrate (208) on the second electrode (206);

dry etching the substrate (col. 3 lines 60-67);

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separating the substrate from the second electrode (206) using the lift pins (218) (See Fig 2-6).

The limitation regarding 'reduces an electrostatic attraction between the second electrode and substrate prior to a lifting of the substrate' has been discussed above. Dhindsa fails to disclose that the insulating material (210) is insulating tape. In a semiconductor method, Kanno discloses the use of adhesive layer (36) (read on "insulating tape") on the electrostatic chuck to reduce residual attraction force (abstract, col. 17 lines 55 to col. 18). Kanno further discloses the attracting force is reduced as the thickness of the spacer increased. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Dhindsa in view of Kanno by using the adhesive layer because it will help to reduce attracting force.

Kanno does not explicitly disclose the insulating tape (or adhesive material) have characteristics which do not lower a degree of vacuum. However, Kanno and the present invention use the same material (i.e. adhesive material). According to the MPEP 2112.01, "The product of identical chemical composition cannot have mutual exclusive property. Chemical composition and its properties are inseparable". Therefore, if the prior art teaches the identical chemical composition, the properties applicant discloses and/or claims (i.e., have characteristics which do not lower a degree of vacuum) are necessarily present.

Both Dhindsa and Kanno do not explicitly use the term "array substrate" in their invention. Nakamura teaches the substrate can be array substrate. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Dhindsa

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and Kanno in view of Nakamura by using array substrate because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 8, both Dhindsa and Kanno teaches the process chamber is a vacuum chamber. Respect to claim 9, Kanno teaches adhesive layer (36) is used in the vacuum chamber. The examiner interprets that Kanno's adhesive layer in the vacuum chamber read on the limitation of "vacuum tape". Respect to claim 10, both Dhindsa and Kanno teaches the power source generates RF power (Dhindsa col. 4 lines 1-2; Kanno col. 10 lines 13-25).

Respect to claims 12 and 14, Dhindsa teaches that the dry etching process is a plasma and/or reactive ion etching. The limitations of claims 15-16 have been discussed in previous paragraphs.

7. Claim 11 is rejected under 35 U.S.C 103(a) as being unpatentable over Dhindsa, Kanno and Nakamura as applied to claim 7 above, and further in view of Collins et al. (US 5,874,361).

Respect to claim 11, Kanno teaches a DC power source (8a/8b) for applying a DC voltage to the lower electrode. Kanno does not teach applying DC voltages to both electrodes. Collins teaches applying DC voltage to upper and lower electrodes (Fig 1). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Dhindsa, Kanno, and Nakamura in view of Collins by applying DC voltages to both electrodes because it would produce uniform high density plasma.

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8. Claim 13 is rejected under 35 U.S.C 103(a) as being unpatentable over Dhindsa, Kanno and Nakamura as applied to claim 7 above, and further in view of Westwood (US 5,985,104)

Respect to claim 13, Dhindsa does teach that the dry etching is an ion beam milling etching. However, Dhindsa clearly teaches the dry etching process is RIE. In a semiconductor process, Westwood teaches that RIE can be used instead of ion beam milling. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Dhindsa, Kanno, Nakamura in view of Westwood by using ion beam milling because equivalent and substitution of one for the other would produce an expected result.

9. Claim 20 is rejected under 35 U.S.C 103(a) as being unpatentable over Dhindsa in view of Kanno (US 6,243,251).

Respect to claim 20, Dhindsa teaches the step of:

- providing an electrode;
- providing an intermediate material (210) on the electrode (Fig 2A);
- providing a substrate on the intermediate material (210) of the electrode to obtain an intermediate structure and processing the intermediate structure (Fig 2A);
- processing the intermediate structure;
- removing the substrate from the electrode using a plurality of pins (218) formed on the electrode to push the substrate away from the electrode (Fig 3-5).

The limitation of reducing electrostatic force prior to a lifting of a substrate has been discussed above. Dhindsa fails to explicitly disclose that the insulating layer (210)

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is adhesive material. In a semiconductor method, Kanno discloses the use of adhesive layer (36) (read on "insulating tape") on the electrostatic chuck to reduce residual attraction force (abstract, col. 17 lines 55 to col. 18). Kanno further discloses the attracting force is reduced as the thickness of the spacer increased. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Dhindsa in view of Kanno by using the adhesive layer because it will help to reduce attracting force.

Kanno does not explicitly disclose the insulating tape (or adhesive material) have characteristics which do not lower a degree of vacuum. However, Kanno and the present invention use the same material (i.e. adhesive material). According to the MPEP 2112.01, "The product of identical chemical composition cannot have mutual exclusive property. Chemical composition and its properties are inseparable". Therefore, if the prior art teaches the identical chemical composition, the properties applicant discloses and/or claims (i.e., have characteristics which do not lower a degree of vacuum) are necessarily present.

Response to Arguments

10. Applicant's arguments filed 9-12-2003 have been fully considered but they are not persuasive. The applicants argue that "the distance described in Dhindsa only becomes a factor after the lifting of the substrate has commenced reduce the electrostatic force after the lifting the array substrate". The examiner disagrees. Before lifting the pins, the examiner certainly can consider the thickness of the insulating layer (210) as the distance between the substrate and the second electrode. Dhindsa

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teaches that the electrostatic force was produced by electro-static chuck (206). The insulating layer (210) acts as the buffer layer between the electrostatic chuck and the substrate. It is well known in the art that an increase in distance will reduce the electrostatic force. Therefore, prior lifting the pins, the thickness of layer 210 will inherently reduce electrostatic force in comparison without having this distance or thickness.

Applicants further argue, "Kanno, which discloses a tape, does not teach special characteristic of the tape such as comprising a material that will not reduce a degree of vacuum". The examiner disagrees. According to the MPEP 2112.01, "the product of identical chemical composition cannot have mutual exclusive property. Chemical composition and its properties are inseparable". Since Kanno and the present invention have the same adhesive material for the insulating layer, the examiner will interpret that the characteristics for the insulating layer disclose by applicant are necessarily present in Kanno's reference.

Conclusion

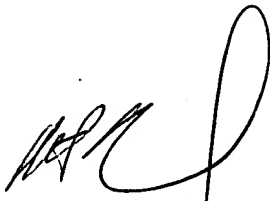
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran



ROBERT KUNEMUND
PRIMARY EXAMINER